PRE-SOLICITATION NOTICE

Low Wind Speed Turbine Concept Studies

May 25, 2001

The U.S. Department of Energy (DOE), through its National Renewable Energy Laboratory (NREL), is soliciting comments on its proposed approach to a cost-shared, public-private project to develop large wind turbines for low- and moderate-wind resource sites throughout the United States.

Background

Wind energy is experiencing strong growth worldwide. In the United States, wind-generated electricity is competitive for grid-connected applications in locations with high-quality wind resources (such as Class 6 sites having annual average wind speeds of 6.4 to 7.0 m/s at a height of 10 meters). Currently, the unsubsidized cost of wind energy at Class 6 sites ranges from 4 to 5 cents/kWh. While development of these high-quality wind resources is expected to be substantial in the near term, limitations of available Class 6 sites, coupled with their distance from load centers and transmission facilities, will eventually constrain U.S. wind energy development to a fraction of its potential.

To position wind energy for continued long-term growth, the DOE Wind Energy Systems Program is focusing its research and development for large (>100kW) systems on technology that will be competitive at Class 4 (5.6 to 6.0 m/s) and Class 5 (6.0 to 6.4 m/s) wind resource sites. This strategic objective will result in a twenty-fold increase in U.S. land areas viable for wind energy development. Furthermore, the lower resource areas are generally closer to load centers. For example, Class 4 wind resource areas are closer to major load centers than Class 6 areas by almost a factor of five.

Achieving cost effectiveness at lower wind speeds will require aggressive, breakthrough technology that builds on lessons learned from ongoing wind-energy, public-private partnerships. Investigation of promising technology under the DOE WindPACT (Wind Partnerships for Advanced Component Technology) project may yield new opportunities for development of advanced wind turbine architectures. The Low Wind Speed Turbine (LWT) Concept Studies, scheduled to begin in 2001, will take advantage of these new opportunities by assisting industry partners in studying advanced concepts for utility-scale turbines incorporating the best new ideas for achieving cost effectiveness at lower wind speeds. The LWT Concept Studies will also build on the success of the DOE Next Generation Turbine (NGT) project scheduled to conclude in the 2003 time frame. At Class 6 sites, the NGT machines are targeted to provide electricity at approximately 3.0 ¢/kWh. At Class 4 sites, they are expected to provide electricity at approximately 5.0 ¢/kWh.

Other factors such as aesthetics, noise, manufacturability, transportability, reliability, and maintainability will also be considered under the LWT Concept Studies. Therefore, the project will take a broad view toward identifying configurations that have high potential for accelerating the production of wind-generated electricity.

Goal and Objective

The overall goal of the LWT project is to partner with U.S. industry to develop technology that makes wind energy a competitive electricity supply option in the extensive Class 4 and 5 wind sites in the United States. The specific objective is to develop large wind turbine systems capable of producing electricity for 3.0 ¢/kWh at Class 4 wind sites by 2007.

Scope of Work

Development of a new wind turbine that results from the best design practices and incorporates the latest technology must proceed in measured steps spanning several years. The LWT project encompasses this complete process. To provide prospective offerors with some insight regarding NREL's long-range plan, the Solicitation Plan below broadly describes the entire anticipated LWT project. However, this pre-solicitation notice is focused on the first step in the process—the LWT Concept Studies.

The LWT Concept Studies will examine the technology and market issues related to achieving the cost-of-energy (COE) objective. The principal subcontract deliverable will be a final report describing the conceptual design of a highly advanced, utility-scale wind turbine capable of operating competitively in low wind sites. The report will describe the studies conducted, including evaluation of innovative concepts suited for low-wind sites, and the assessment of related technology and market issues. It will explain why the proposed concept is expected to achieve the COE objective, and disclose the projected performance, budget, and schedule for a full-scale turbine development effort. The report will also identify a proposed team for the utility-scale, turbine-development effort and provide an assessment of the technical and financial capabilities of that team.

Solicitation Plan

NREL intends to conduct a competitive procurement with industry to perform the LWT Concept Studies. A Request for Proposals (RFP) is scheduled for release in September 2001 that will require an offeror to describe its proposed concept in sufficient detail to be understood and evaluated by a group of knowledgeable reviewers. Offerors must also identify the planned teaming arrangements, budget, and schedule for their proposed concept study projects. NREL expects a majority of the subcontract work to be performed within the United States, and offerors will be asked to demonstrate the economic benefits of the proposed project to the United States. These important requirements will be among the program policy factors considered in evaluating and ranking the submittals. Qualified business and technical professionals will evaluate these written proposals, which will be restricted to a maximum of 15 pages. Awards will be based upon technical feasibility, projected COE, offeror's capabilities, and likelihood of achieving program goals and objectives. Approximately $600,000 of DOE funds will be available to support 4–6 subcontracts of 3–6 months duration.

To expedite the LWT Concept Studies, NREL intends to use fixed-price subcontracts. Cost sharing for the concept studies stage will not be required of industry participants. Consequently, intellectual property issues may have to be negotiated for each subcontract. All offerors will be required to identify proprietary data developed at private expense prior to proposal submission. Patent rights will be handled in accordance with applicable statutes and DOE regulations. Possibilities for protecting subcontract data developed at government expense under the LWT Concept Studies subcontracts include segregating deliverables or reverting to cost-shared subcontracts.

After the LWT Concept Studies are completed, DOE and NREL will evaluate whether or not sufficient promise exists to warrant full-scale development. Typically, this development process requires at least two additional steps. The first is a detailed design effort and the second is the fabrication, testing, and

certification of a prototype turbine. If the studies yield encouraging results, several industry partners will be competitively selected to carry their concepts through a rigorous design process of sufficient detail to permit evaluation by NREL. DOE, NREL, and their industry partners will cooperatively seek an implementation, including size or rated power that appears to be appropriate for the marketplace. In a subsequent cost-shared effort, selected designs would then move forward through fabrication and testing of commercial prototypes that are expected to meet the project goals and objectives. Proof-of-concept turbines would be expected to operate by 2005 and final prototype turbines would be expected to operate by 2007. NREL anticipates that approximately $30 to $50 million of DOE funding over 4–5 years will be required to support 3–4 subcontracts for this development effort. It is expected that each project will be funded incrementally and that the industry partners will provide a minimum cost share of 20%, with a target of 50%.

Throughout this process, NREL will encourage the use of best business and project-management practices. Disciplined engineering development processes, including rigorous laboratory and field tests to verify component and subsystem designs that will lead to certification and commercial deployment will be emphasized.

Expressions of Interest

The purpose of this pre-solicitation notice is to obtain an indication of the level of interest by industry participants in the cost-shared project described in the Solicitation Plan. Therefore, expressions of interest are sought from potential respondents to the forthcoming RFP, and comments on the proposed plan and scope-of-work are sought from all interested parties. Because the LWT project targets bulk-electricity generation, NREL is interested in comments from potential developers, owners, operators, utilities, and manufacturers. This notice is also intended to promote the formation of industry partnerships and to stimulate interaction among potential participants. Failure to respond to this notice will not disqualify anyone from participation in the solicitation, but those that do respond to this notice are assured of receiving the RFP and notification of related activities, if they indicate that desire. Expressions of interest should not include detailed proposals, but should include the following information: 1) the names, addresses, telephone numbers, and facsimile numbers of the primary contact person and key collaborators, 2) the potential participants, their affiliations, and their proposed roles, 3) comments on the proposed plan, scope-of-work, cost-sharing, and funding, and 4) a statement indicating whether or not the respondent wishes to receive a copy of the RFP. Responses to this notice should not exceed five pages and they should be received at NREL by June 29, 2001. This is not a request for proposals.

Please send responses by mail or facsimile to:

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